compound. The author also stated that these substances facilitate the study of the relation between the chemical constitution and distribution of poisons in the body.

15 (61). **"On the rate of absorption from intramuscular tissue,"** with demonstrations: **S. J. MELTZER** and **JOHN AUER.**

In physiology no distinction is made between absorption from the subcutaneous tissue and absorption from muscles. In experimental infection and immunity, injections of virulent toxic and antitoxic materials are being extensively employed, but intramuscular injection has not yet even been thought of. In therapeutics it is practised promiscuously, and for the reason, as pharmacologists and clinicians expressly state, that it gives less pain and causes less frequently the formation of abscesses.

The authors came upon the observation that absorption from the muscles is incomparably more rapid and efficient than from the subcutaneous tissue and tested the matter with several substances. With *suprarenal extract*, it was tested in three ways.

1. *By the effect upon blood-pressure.* — A subcutaneous dose of 0.6 c.c. adrenalin or less per kilo (rabbit) exerts no effect, and the variable effects of larger doses consist in a rise of pressure of from about 10 mm. to 20 mm. of mercury, which sets in late and develops slowly. An intramuscular injection of 0.5 c.c. or 0.4 c.c. per kilo, or even less, invariably causes, on the other hand, a considerable rise of pressure, which sets in after a very short latent period and reaches its maximum in a few seconds. The curve obtained after intramuscular injection is very similar to that after an intravenous injection. The increase has been as high as 50 mm. or 60 mm. of mercury and may go even higher. The course of the curve is frequently interrupted by "vagus pulses."

2. *By the effect upon the pupil on the side from which the superior cervical ganglion had been previously removed.* — An intramuscular dose of 0.5 c.c. or 0.4 c.c. of adrenalin per kilo causes dilation of the pupil in less than a minute, while such a dose given subcutaneously rarely produces any effect. The effect of a larger subcutaneous dose sets in only after 10 or 15 minutes.

3. *By prostration effects.* — A dose of 0.5 c.c. per kilo will prostrate a rabbit in a minute or two, after intramuscular injection.

In cases of subcutaneous introduction, prostration does not occur until after 20 or 30 minutes, and even then is induced only by much larger doses.

Further tests were made with *curare*. A dose can be found which will have no apparent effect after subcutaneous injection, but which, after intramuscular introduction, will cause paralysis of the voluntary muscles in a few minutes. The authors also established striking differences between the effects of the two modes of application in the cases of *morphin* and *fluorescein*.

Tenth meeting.[1]

[Second Annual Business Meeting.]

Rockefeller Institute for Medical Research. February 15, 1905. President Meltzer in the chair.

16 (62). **"Degrees of susceptibility to diptheria toxin among guinea-pigs. Transmission from parents to offspring": THEOBALD SMITH.** (Presented by **WILLIAM H. PARK.**)

The author called attention to the usefulness of the antitoxin unit furnished by the Institute for Experimental Therapy under the direction of Professor Ehrlich in the routine testing of the strength of diphtheria antitoxin. The one uncertain element is the relative resistance of the guinea-pigs to diphtheria toxin.

In the course of the past nine years the author has given considerable personal attention to this subject and found that different dealers furnished guinea-pigs of slightly different susceptibility. This difference was attributed to environment and care. The animals bred under the author's supervision generally showed maximum resistance. Irregularities in the routine tests during the past year led the author to look up the genealogy of the pigs used and he found that the different degrees of resistance belonged to certain families or litters and were constant for those families. Thus, one mother gave birth to young which did not react to what was the usual fatal dose. Four successive litters possessed the same resistance. As each pig could be tested but once the precise degree of resistance could not be measured, but it appeared prob-

[1] Reprinted from *Science*, 1905, xxi, p. 580; *American Medicine*, 1905, ix, p. 491; *Medical News*, 1905, lxxxvi, p. 666.